

# Joint Strike Fighter – Lightning II Monthly Assessment Report

Prepared for the Joint Strike Fighter Program Office  
Prepared by DCMA Lockheed Martin Fort Worth



September 2009

## Table of Contents

Program Summary .....	3
Report Scope.....	5
Maintain LRIP Aircraft Delivery Rate .....	6
Improve Supplier Delivery Rate .....	8
Improve Supplier Quality Rate .....	11
Maintain Cost and Schedule .....	11
Reduce Schedule Variation.....	16
Non-Conformance Reduction .....	20
Safety of Flight (SoF) .....	21
Improve Software Productivity.....	22
Improve Minor Variance .....	23
Improve FCA/PCA .....	24
Maintain Assist Audit Request Timing .....	25
Maintain FAR Requests for Contract Closeout .....	25
Reduce Cancelling Funds .....	26
Appendix A – EV Assessment Criteria .....	26



## Program Summary

**Flight Test:** Execution of the Flight Test Schedule continues to be a significant Program concern. BF-1 returned to flight (#15) on 4 Sep 09, after completion of a modification period lasting almost one year, the flight was successful with only minor squawks reported. Program target ferry date to PAX is 29 Sep 09 (MS 6.1 baseline was 27 May 09). AA-1 ferried to Edward Air Force Base on 10 Sep 09 and is scheduled to begin taxi/hook testing in late September or early October, followed by live-fire testing at China Lake.

SDD/LRIP Production Status		(As of 14 Sep 09)
Forward Fuselage	13 – Assembly 14 – Mate/Sub-Systems/Final	
Center Fuselage	15 – Assembly/On-Dock 14 – Mate/Sub-Systems/Final	
Aft Fuselage	9 – Assembly/On-Dock 14 – Mate/Sub-Systems/Final	
Wing	14 – Assembly 14 – Mate/Sub-Systems/Final	
EMAS	5 – (AF-9, AF-8, AF-7, AF-6 & AF-4)	
Moving Line	4 – (AF-2, CF-2, CJ-1 & CF-3)	
Final Assembly	2 – (CF-1 & AF-3)	
Run Stations	5 – (BF-2, AF-1, BF-3, BF-4 & BF-1)	
Labs	2 – (BG-1, BH-1)	
Deployed	3 – (AG-1, AJ-1, AA-1)	

**Schedule:** Efforts towards the sixth schedule revision (MS 6.2) continue. Integrated Product Team (IPT) inputs, as well as an updated Flight Test plan (V16), are anticipated by mid-November, with an IMS baseline expected in mid-December.

**DD-250 Deliveries:** DD250 delivery dates for LRIP 1 are not recoverable. LRIP deliveries are not projected to be met until LRIP 3, and are largely dependent upon Wing-at-Mate overlap elimination, timely availability of tooling, change integration, part deliveries and alignment of EBOM, MBOM and As-Built data.

**Change Request's (CR's):** The volume of major CR's is projected to continue. While much of this volume was anticipated within the Program, the number of major changes has exceeded projections. Additionally, the impacts of timing these changes and the disruption to the floor were not anticipated. There are several reasons behind these changes such as engineering maturity, requirements maturity, producibility and known risk that were expected for the most part, however; change as a result of design errors, assembly issues and integration issues were not anticipated as they have been seen. Several findings as a result of lab discoveries, AA-1 and BF-1 flight test data analysis has been positive, although LM Aero has identified several future change areas of concern. To facilitate management of change implementation, LM Aero has created a multi-disciplined team to support change from approval to implementation.

██████████ (Center): ██████████ is now working to the new SOP (MS 5B) as of 31 Jul 09 to support the latest LM Aero need dates. ██████████ has multiple assembly operations producibility issues impacting cost and schedule primarily in ██████████ and some in ██████████

██████████ has various teams who review plans and cost/schedule variances to affect positive change.

[REDACTED]

[REDACTED] Other concerns are LM Aero interface issues.

[REDACTED] **(Aft/Empennage):** [REDACTED] has submitted their detailed delivery schedule forecast to LM Aero to be incorporated into MS 6.2. The delivery schedule forecast dates are in line with [REDACTED] Shop Operating Plan (SOP 8 issue 2) that covers deliveries from SDD through LRIP 2. Composite production is not meeting the demands of the production operations – composites for the AFT and Empennage assemblies are paced by the availability and quality of composites. [REDACTED] has developed a 10-point action plan, outlining their methodology for improving Carbon Fibre Composites (CFC) output. Additionally, [REDACTED] machining operations continue to be a concern. [REDACTED] has developed a recovery/sustainment plan. The CFC and Machining backlog varies during the month, but the current demands of the production line are not being met. As a result, [REDACTED] has initiated building a new machining facility to help meet current and future machining demands, and is currently reviewing options for outsourcing the backlog machining demands as a temporary measure. [REDACTED] are being used by [REDACTED] in assembly operations. [REDACTED] and LM Aero will need to develop a plan on how to best resolve the issue with little impact as possible to the assembly schedule. Several options are being considered that could include the following: On-site [REDACTED] representative, ship items to LM Aero for disposition, remove the item from the production line and return to the [REDACTED] vendor. Shipping stillage remains an issue for the F-35 program – a shipping stillage forecast requirements schedule/agreement is needed between LM Aero and [REDACTED]

[REDACTED]

**EV Corrective Action Plan (CAP):** As reported in the July 2009 MAR, LM Aero/Corporate hosted the DCMA EV Center in June 2009 and provided DCMA with status of their EVMS CAP. The EV Center suggested an alternate approach to a full-up Compliance Review, allowing the contractor to do a self assessment. The approach was agreed to by all parties, and LM Aero/Corporate has submitted their self assessment information to the EV Center. The data will be reviewed by the EV Center and both parties will meet in late September 2009 to discuss the results.

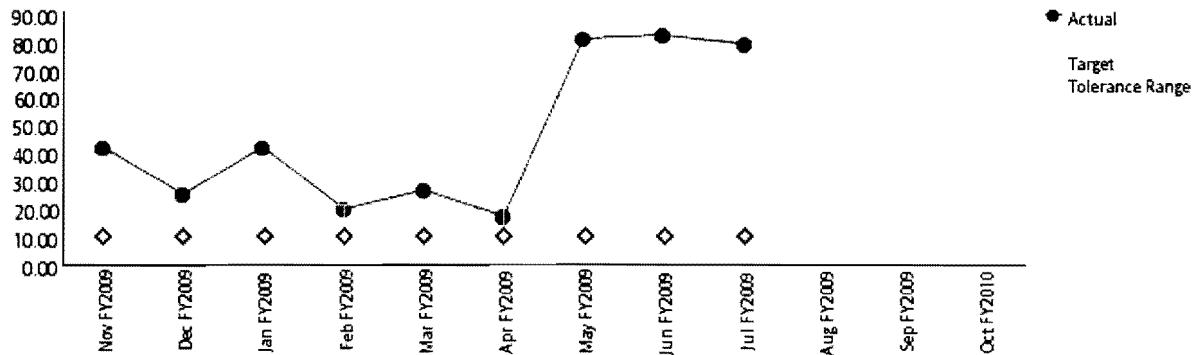
## Report Scope

The Joint Strike Fighter – Lighting II Monthly Assessment Report (MAR) is focused on reporting the status of Customer Outcomes and associated Performance Indicators identified in the Memorandum of Agreement with the JSF Program Office. Interdisciplinary teaming between DCMA personnel is used to ensure customer outcomes are ascertained; risks to outcomes are identified and assessed.

Title	Performance Indicator	Metric Rating Criteria	Rating
Maintain LRIP Aircraft Delivery Rate	Maintain LRIP aircraft delivery to within 10 M-days of contract delivery date	Green: ≤10 M-day variance to delivery date Yellow : 11 – 21 M-day variance Red: >21 M-day variance to contract delivery date	
Improve Supplier Delivery Rate	JSF Key Suppliers have an average delivery rating of greater than or equal to 96%	Green: 100.0 to 96.0% Yellow: 95.9 to 87.0% Red: ≤86.9%	
Improve Supplier Quality Rate	Each delegated supplier has quality ratings >96%	Green: ≥ 96% Yellow: 87%-95% Red: <87%	Y
Maintain Cost and Schedule	Resource requirements are aligned in support of funding and budget allocations. IEAC data and projections match actual performance within + / - 10% of contractors budget at completion	Green: 1.0 to 0.95 variance (5%) Yellow: 0.95 to 0.90 variance (5% to 10%) Red: 0.90 or greater variance (>10%)	G
Reduce Schedule Variation	Reduce the average Wing touch labor variance "at move to mate" to within 10% by SDD completion	Green: < -10% Yellow: -10% to -15% Red: > -15%	Y
Non-Conformance Reduction	10% reduction in MRB discrepancies per year	Green: < the goal of 21 Yellow: within 10% of the goal Red: >10% above the goal of 21	G
Safety of Flight (SoF)	Number of SOF inspections accepted on first attempt to the number of SOF inspections conducted	Green: 100% Yellow: 95%-99.9% Red: <94.9%	
Improve Software Productivity			G
Improve Minor Variance	Maintain at least a 95% correct classification rate of variances	Green: % of properly classified minor variances is ≥95% Yellow: 90% up to but not including 95% Red: <90%	G
Improve FCA/PCA	Ensure that at least 95% of systems reviewed in interim FCA/PCAs meet the design requirements	Green: % of parts meeting design requirements is ≥ 95% Yellow: 90-94% Red: <90%	G
Maintain Assist Audit Request Timing	Process contractor/PCO requests for domestic/international Assist Audits within 2 business days 85% of the time	Green: >84% Yellow: 75%-84% Red: <75%	G
Maintain FAR Requests for Contract Closeout	Maintain 94% contract closeout actions within the Federal Acquisition Regulation (FAR) mandated timeframes	Green: >93% Yellow: 85%-93% Red: <85%	G
Reduce Cancelling Funds	90% of canceling funds will be billed and/or de-obligated before the end of the fiscal year	Green: >89% Yellow: 80%-89% Red: <80%	

## Maintain LRIP Aircraft Delivery Rate

**NSF198AJ17:** Description: Maintain LRIP aircraft delivery to within 10 M-days of contract delivery date. The Maintain LRIP Delivery Rate is an Integrated Master Schedule (IMS) based metric of the monthly average (+/-) float manufacturing days (M-days) of all reported LRIP aircraft to their contract delivery schedule (DD-250). Goal is to maintain delivery of LRIP aircraft to within 10 M-days of contract delivery date. **Note: Float M-days are entered as positive values, but represent behind schedule status.** Monthly IMS LRIP CDRL data is directly used as data source. Data shall be updated NLT the 20th of each month. Total Float of all reported aircraft that have passed their baseline start date will be averaged monthly for metric. Green: ≤10 M-day variance to delivery date, Yellow: 11 – 21 M-day variance, Red: >21 M-day variance to contract delivery date.



Metric Status: Red

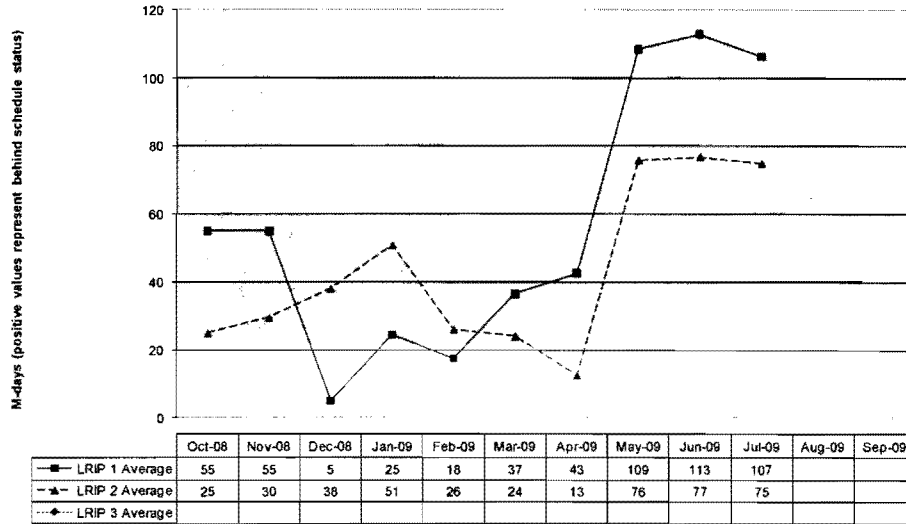
Trend: No appreciable trend since last report.

Summary of Metric Status: Metric is -79 Mdays for month end July. DD250 delivery dates for LRIP 1 are not recoverable. LRIP deliveries are not projected to be met until LRIP 3, and are largely dependent upon Wing-at-Mate overlap elimination, timely availability of tooling, change integration and part deliveries.

Root Causes: LRIP 1 – Critical paths for July are basically the same as last month. Impacts as a result of projected dates encompassing CR and traveled work that were laid into the schedule in May continue to be seen. AF-6 and AF-7 did load into the EMAS in July. AF-6 variance to EMAS load was 61 days, while AF-7 variance to load was 59 days.

LRIP 2 – Impacts from May's updated move forecast projections due to EMAS stations being populated with SDD aircraft longer than anticipated, as well as EMAS spans that were increased to more accurately reflect the expected durations continues to be seen in LRIP 2 build. Timely availability of tooling (SDD/LRIP 1 units completing on time) and late part deliveries continue to be concerns. AF-8 variance to EMAS load was 47 days.

LRIP Breakdown - DD-250 Performance (M-Days)  
2009 CDRLs



█: The Aft Fuselage for AF-9 shipped on 27 Jul 09 – only 2 weeks late to contract. This assessment is based upon delivery/recovery dates in Attachment B1 to PO M6604 for LRIP 2. The AFT Fuselages for AF-10 and AF-11 are projected to ship the first week of September.

█: LM Aero has directed █ to delay delivery of LRIP 2 Center Fuselages in an effort to align with Mate activities – risk to █ delivery schedule is assessed as low. █ anticipates parts availability for LRIP 3 will be drastically improved compared with LRIP 1 / LRIP 2 – LRIP 3 now is expected to be on schedule.

Contractor Actions: Mitigation activities such as the use of overtime, integration teams, span adjustments, and out of station installations for late parts continues. Another revised Program schedule (MS 6.2) will occur. Efforts towards the sixth schedule revision (MS 6.2) continue. Integrated Product Team (IPT) inputs as well as an updated Flight Test plan (V16) are anticipated by mid-November, with an IMS baseline set in mid-December.

DCMA Actions: DCMA LMFV P/SI, PA Production and PA D&I Team members continue to mature performance indicator sub-metrics to assess key build event progress on LRIP aircraft. These metrics will utilize data from the IMS and various shop floor systems.

Estimate when metric will achieve goal: Potentially LRIP 3 timeframe.

The table below includes the total SCOPs planned for LRIP aircraft, the number of SCOPs completed as of the reporting period, the percentage of SCOPs completed relating to the total planned for the specific test article and the percentage of testing completed prior to test article rollout from the factory to the flight line (Rollout).

SCOP testing starts at the trailing end of █. The current IMS baseline finish dates for AF-6 through AF-13 are annotated below. New effectivities will be added once planning against those aircraft is formally released.



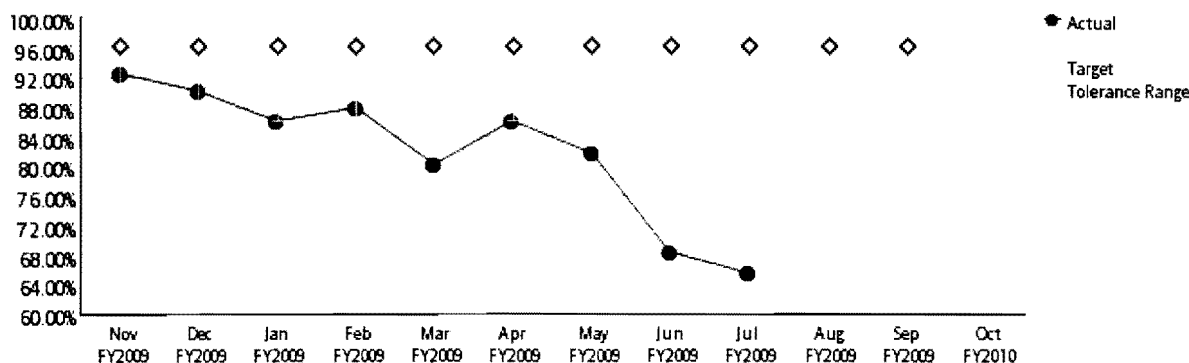
### SCOP Completions per Aircraft (A/C)

Aircraft Effectivity	Baseline Finish Date (SWBS 240)	Total SCOPs Planned	Planning Formally Released	SCOP Completed	%Complete (Total A/C)	% Complete prior to Rollout
AF-6		94	40	6	6.38%	6 Oct 09
AF-7		94	39	5	5.32%	27 Oct 09
AF-8		94	38	2	2.13%	24 Nov 09
AF-9		94	38	5	5.32%	4 Jan 10
AF-10		94	27	1	1.06%	1 Feb 10
AF-11		94	27	-	-	1 Mar 10
AF-12		94	9	-	-	29 Mar 10
AF-13		94	4	-	-	26 Apr 10

Currently 102 SCOPs and 21 AEI's (Aerospace Equipment Instructions) are formally released against the above aircraft.

### Improve Supplier Delivery Rate

**NSF198AJ21:** Description: JSF Key Suppliers have an average delivery rating of greater than or equal to 96 percent. JSF Key Suppliers are determined by analyzing category 3 and 4 shortages to jig load. JSF Key Suppliers may be adjusted on a quarterly basis as new issues emerge. This metric is a monthly average percent of lots delivered on-time for JSF Key Suppliers. The goal is to achieve an average of 96 percent or greater on-time lot delivery rate. Supplier delivery data is obtained from LM Aero's Supplier Quality Management and Procurement Quality Network databases. These databases are updated on approximately the 15th of each month. The monthly data from each database is reflective of the previous month's performance. This metric will be updated within one week of the LM database updates. Green: 100.0 to 96.0%, Yellow: 95.9 to 87.0%, Red: ≤86.9%.



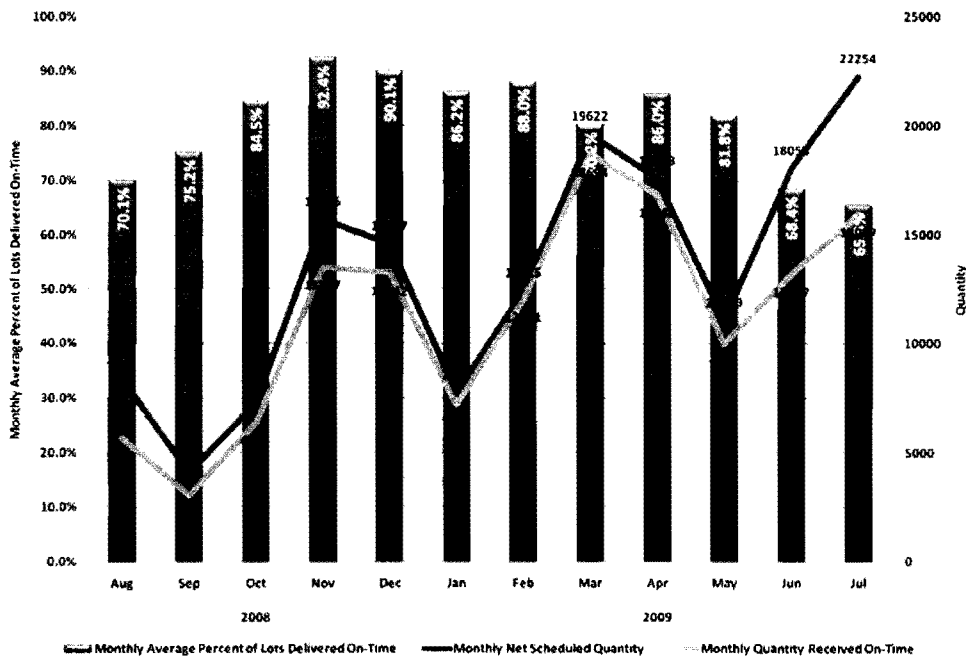
Metric Status: Red

Trend: Declining

Summary of Metric Status: The delivery rate declined 3.1% to a monthly average of 65.5%, representing the third month of decline.

The chart below shows the overall delivery performance over the past 12 months for the top 50 DCMA JSF Key Suppliers. The blue vertical bars represent the monthly average percent of lots delivered on-time. The upper red line represents the monthly net scheduled quantity of parts which were to be delivered by these 50 suppliers, and the lower green line represents the monthly quantity of parts received on-time from these 50 suppliers.

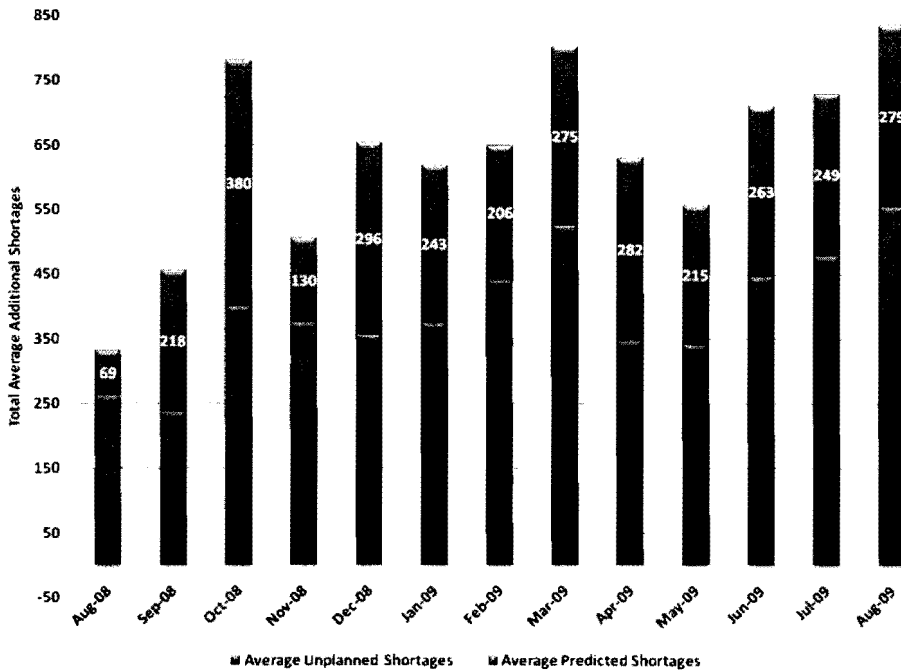
**JSF Top 50 Key Suppliers - Overall Delivery Performance - Aug 08 to Jul 09**



**Root Causes:** The root causes of the poor delivery performance continue to be late authorizations (late requirements to suppliers, rapidly changing requirements due to engineering changes, schedule pressures, and Bill of Material errors). Additionally, increasing scrap/loss is causing an increase in unplanned shortages.

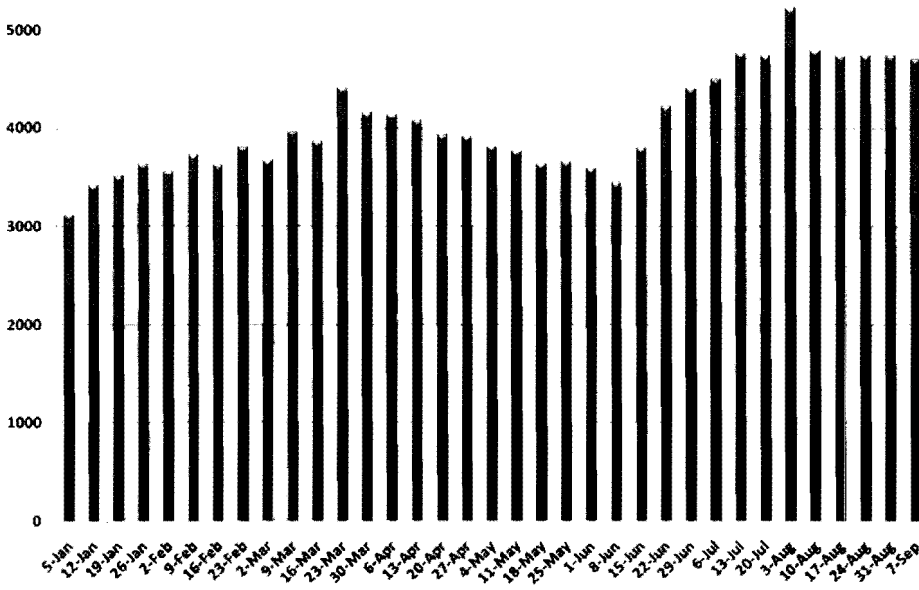
**Contractor Actions:** To correct the negative delivery performance, LM Aero has now deployed a total of 50 Supply Chain Managers to focus suppliers. A "Change War Room" has been instituted to directly address the negative impact of engineering changes on suppliers, and LM Aero has established a buffer stock for high scrap parts. Additionally, LM Aero Procurement Directors have been assigned to personally engage with top 15 critical shortage suppliers.

**DCMA Actions:** DCMA has initiated approximately 25 Letters of Delegation to monitor and report on JSF Key Suppliers with significant negative impact on the delivery rate. DCMA Lockheed Martin Fort Worth is continuing their analysis of "unplanned shortages." These are shortages that result from design issues, supplier quality assurance reports, and parts that are either scrapped during installation or "lost in shop." As shown in the chart below, there was another increase in August for unplanned shortages.



As shown in the chart below the overall amount of shortages remained fairly stable for the month of August, however the total remains high and is negatively impacting the overall supplier delivery rate.

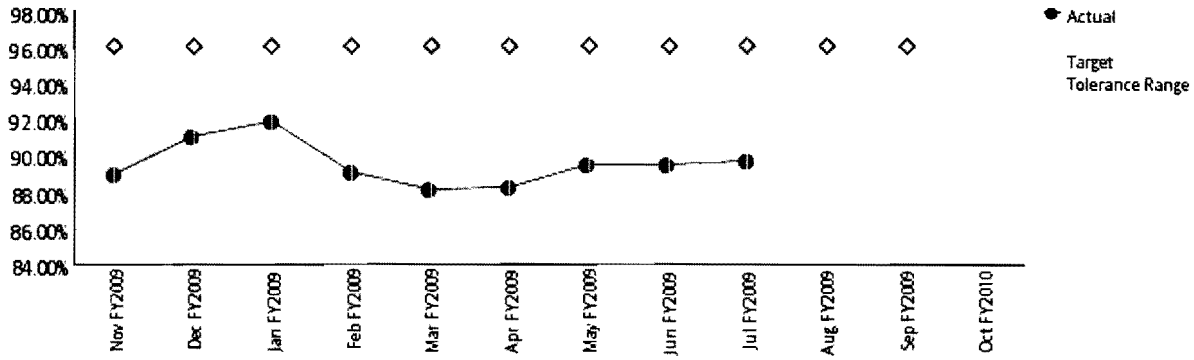
Total Shortages - 2009 to Date



Estimate when PC will achieve goal: LRIP 3 to LRIP 4 (2011 to 2013).

## Improve Supplier Quality Rate

**NSF198AJ10:** Description: Each delegated supplier has quality ratings greater than 96 percent. The total LM Quality rating for key suppliers (areas of consideration are: cost, issues, technical, criticality). The top suppliers are summed and divided by quantity which gives an average QA rating per month. The goal is to achieve an average of greater than 96%. Supplier quality data is obtained from LM Aero's Procurement Quality Assurance database and metric updated no later than the 20th of each month. Green:  $\geq 96\%$ , Yellow: 87 to 95%, Red:  $< 87\%$ .

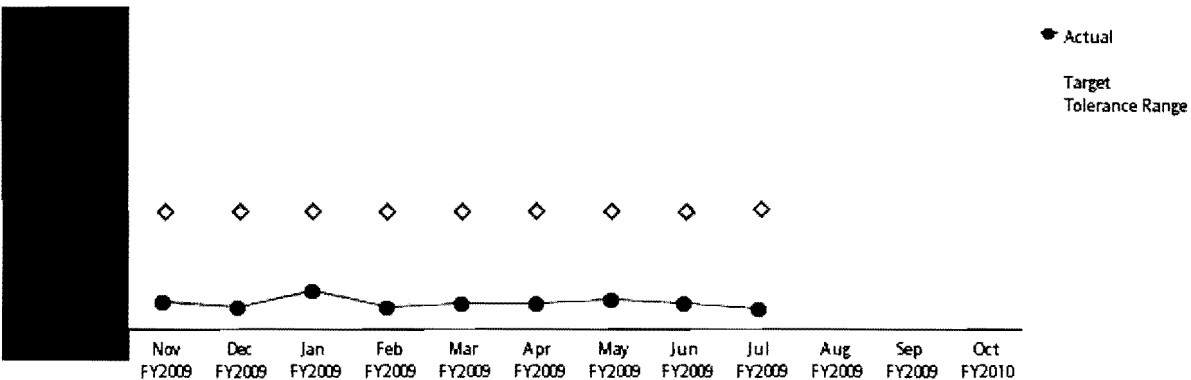


Metric Status: Yellow

Trend: No appreciable change since last report.

## Maintain Cost and Schedule

**NSF198AJ08:** Description: Resource requirements are aligned in support of funding and budget allocations. IEAC data and projections match actual performance within  $\pm 10\%$  of contractor's budget at completion. DCMA Independent IEAC is measured against the prime contractor's BAC. DCMA includes risk, pressures, cost and schedule variances as compared to LM Aero BAC. The source of EV data comes from the monthly JSF SDD Cost Performance Report which lags by 1 month. Metric is updated in Metrics Manager as soon as data is received from contractor (**approximately 45-60 days after end-of-month**). This is represented as the contractor's BAC as the Numerator divided by DCMA's IEAC as the Denominator - with a 10 percent tolerance band. Green: 1.0 to 0.95 variance (5%), Yellow: 0.95 to 0.90 variance (5% to 10%), Red: 0.90 or greater variance ( $> 10\%$ ).



Metric Status: Green

Trend: No appreciable trend since last report.

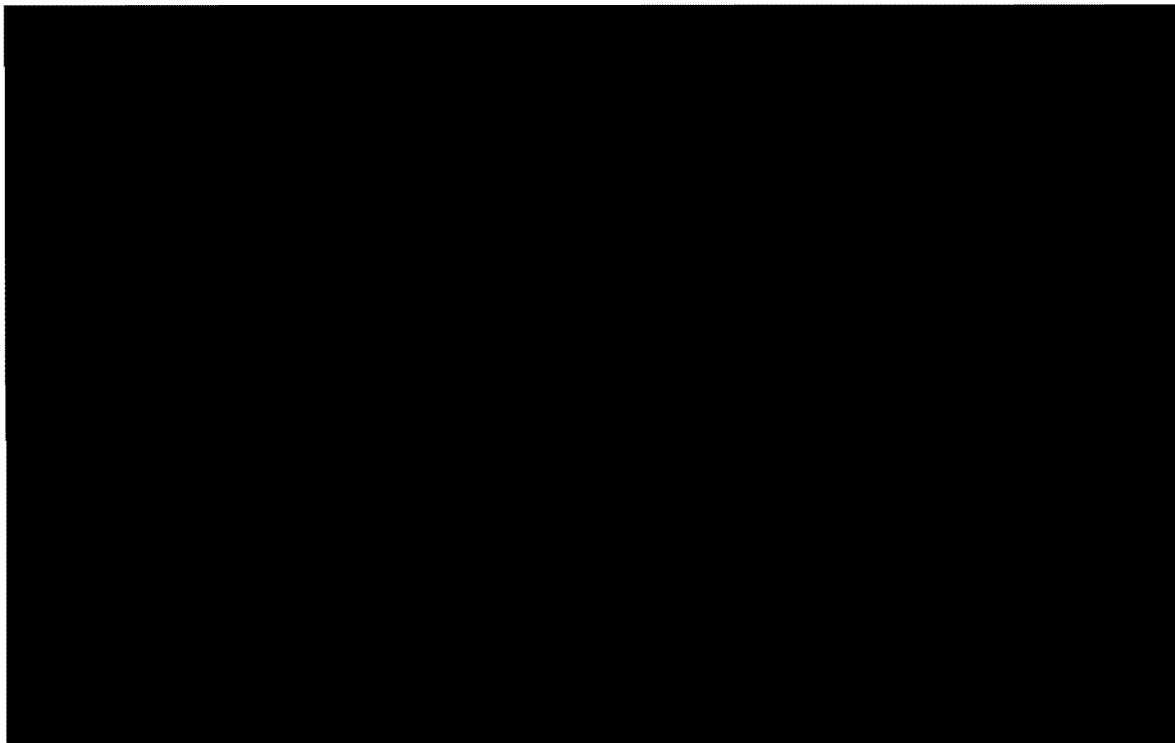
Lockheed Martin is now reporting to an Over Target Baseline of [redacted] reported in the July 2009 Cost Performance Report (CPR). DCMA IEAC is [redacted] for the SDD contract. This DCMA IEAC is based upon the July 2009 CPR report.

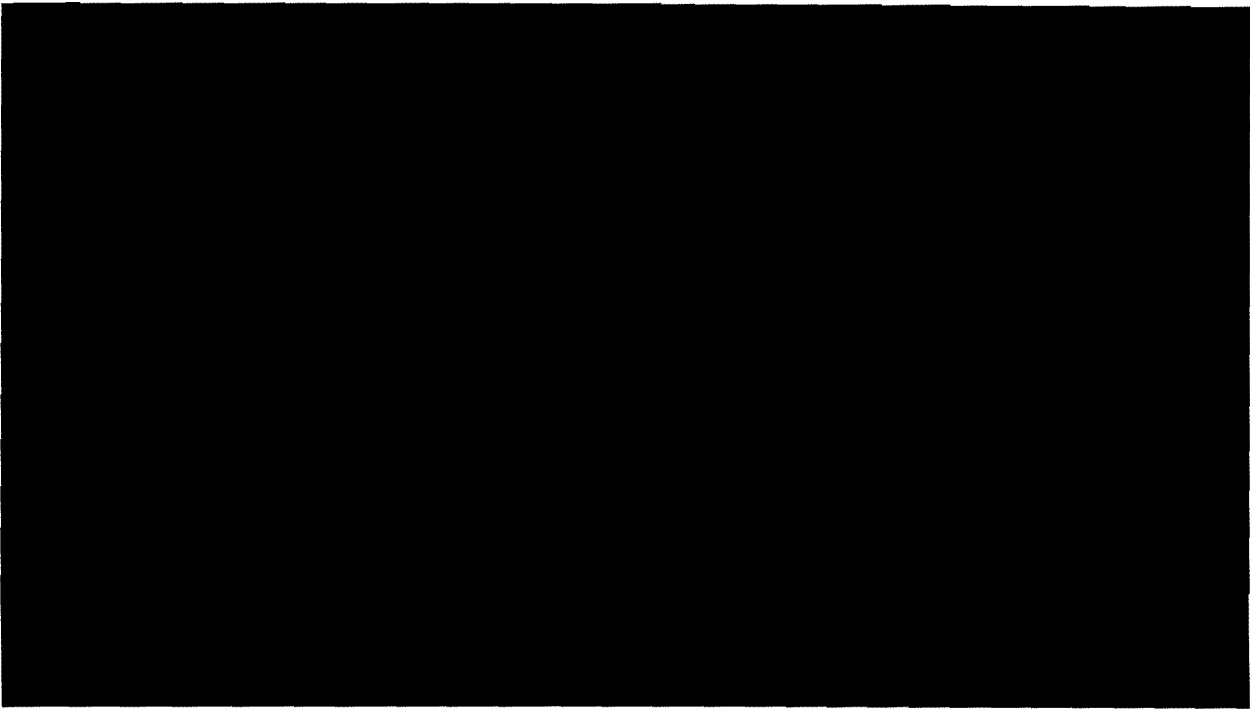
LM Aero has expended an average of [REDACTED] per month over the last six months. Assuming a continuance of this expenditure rate, DCMA projects the existing SDD budget with OTB will be depleted in FY2011, [REDACTED]

LM Aero has prepared EAC8, incorporating DCROM base of potential threats and pressures in the July 09 CPR report. The input from [REDACTED] that was unavailable last month has now been included in July CPR report. The EAC -8 has no MR remaining, further straining the financial management of the program. The EAC8 is under DCMA review to verify that potential suppliers' cost growth, future TCRs, etc are considered in the DCROM. The LM's EAC8 projected MR is zero and therefore will be unavailable to offset any risks remaining in flight testing and software coding. Without that reserve, and assuming the same efficiencies, the program is likely to require additional funding for completion of the SDD contract.

Using the Standard formula based on cumulative SPI and CPI (since replan) yields an SDD increase of [REDACTED] over current LM Aero BAC. With the addition of risk factors such as, Suppliers' cost growth, Late to Need parts, Schedule Impacts, Production Delays, Change Requirements, Flight Test, DCROM data, etc. the DCMA IEAC totals [REDACTED] vs. the LM Aero BAC of [REDACTED] and is [REDACTED] higher than LMs BAC or [REDACTED] higher than EAC. The DCMA's IEAC includes the threats and pressures at [REDACTED]. The repair costs for the latter have been estimated as [REDACTED] last month and continue to be undefinitised.

The graphs below illustrate the DCMA's past projections of IEAC against LM's BAC and LRE.





The July 2009 SDD/LRIP cost summary and program status is as follows:

<b>SDD</b>	<b>BAC</b>	<b>LM EAC CPR</b>	<b>DCMA IEAC</b>
Performance Measurement Baseline (PMB)	[REDACTED]	[REDACTED]	[REDACTED]
Management Reserve (MR)	[REDACTED]	[REDACTED]	[REDACTED]
Total:	[REDACTED]	[REDACTED]	[REDACTED]

<b>LRIP 1</b>	<b>BAC</b>	<b>LM EAC CPR</b>	<b>DCMA IEAC</b>
Performance Measurement Baseline (PMB)	[REDACTED]	[REDACTED]	[REDACTED]
Management Reserve (MR)	[REDACTED]	[REDACTED]	[REDACTED]
Total:	[REDACTED]	[REDACTED]	[REDACTED]

<b>LRIP 2</b>	<b>BAC</b>	<b>LM EAC CPR</b>	<b>DCMA IEAC</b>
Performance Measurement Baseline (PMB)	[REDACTED]	[REDACTED]	[REDACTED]
Management Reserve (MR)	[REDACTED]	[REDACTED]	[REDACTED]
Total:	[REDACTED]	[REDACTED]	[REDACTED]

Budget Baseline and EAC Summaries

Contract Data	KT 1	KT 2	KT 3	KT 4
Contract #	N00019-02-C-3002	N00019-06-C-0291	N00019-07-C-0097	N00019-08-C-0028
Name	JSF SDD	LRIP 1	LRIP 2	LRIP 3
Contract Type	Cost Plus Award Fee	Cost Plus Award Fee	Cost Plus Award Fee	Cost Plus Award Fee
Obligated Amount	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
ULO	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Performance Start/End	Oct 2001/Oct 2014	May 2007/Feb2010	Apr 2010/Feb 2011	Mar 2011/Dec 2011

Primary Trip Wires				Secondary Trip Wires				
System Indicator	Baseline Indicator	Cum BEI	SPI	Cum CPLI	CPI	CPI/TCPI 10%	Contract Mods 10%	Baseline Revs 5%
						7.7%	[REDACTED]	N/A

**Primary Trip Wires –**

- (a) System Indicator: Please see EV section of report.
- (b) Baseline Indicators: A baseline assessment shows the contractors BAC and EAC to be optimistic. To complete the contract within the CBB, the contractor needs to be about 7.7 percent more efficient. The BAC has increased by 40% since the start up in Oct of 2001. The cost growth is likely to increase due to inherent engineering risks in the first versions of STOVL and CV aircraft.

**Secondary Trip Wires –**

- SDD Baseline Execution Index (BEI): Cumulative tasks from October 2001 thru August 2009: Cum BEI = 143,582 Completed Tasks/147,058 Planned Tasks = 0.98
- SDD Monthly (August 2009) Tasks: 417 Completed Tasks vs. 1078 Baselined to Complete Tasks
- SPI (since replan) = BCWP/BCWS= 0.982
- SDD CPLI = (1282 + (15)/1282 = 0.99 (Time Now = 30 Aug 09)
- CPI (since replan) = BCWP/ACWP= 0.969
- CPI/TCPI = 0.969/1.030 = .941
- Contracts Mods – (BAC now)/original BAC 10/01 = [REDACTED] = 1.40

The DCMA Risk Rating for EVMS at the total program level is rated green using the agreed to parameter of VAC (-4.072%).

Similarly, the TCPI<sub>EAC</sub> is different when using the DCMA IEAC versus the contractor's EAC:

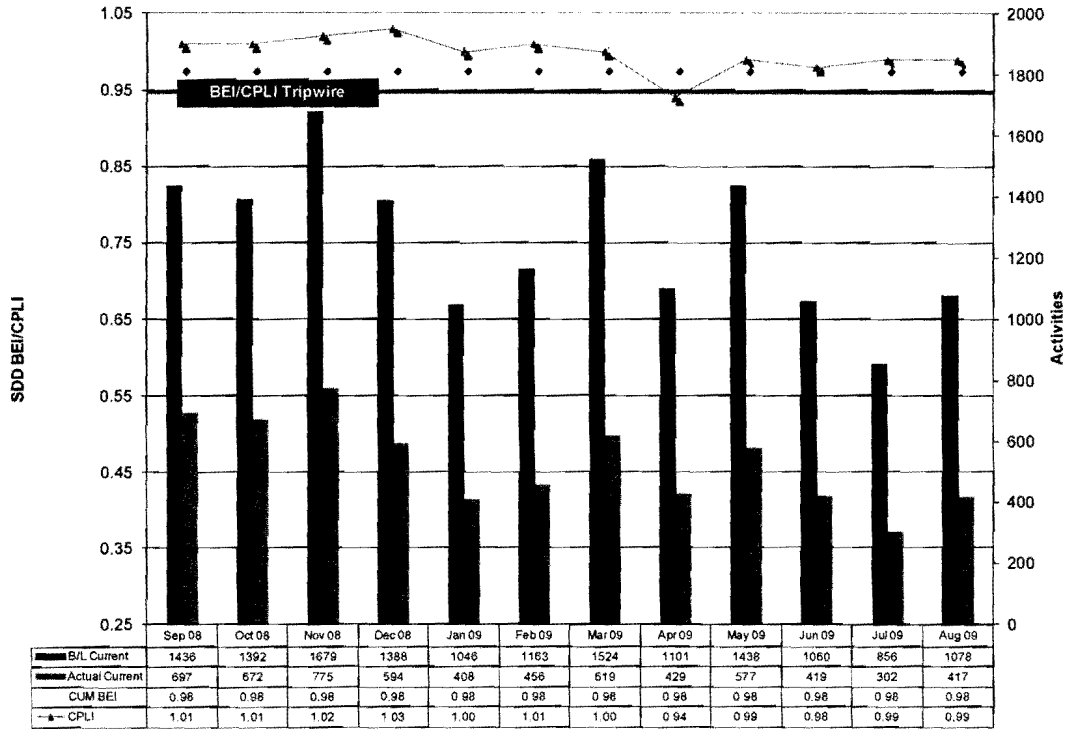
$$TCPI_{DCMA\ IEAC} = 0.920$$

$$TCPI_{LM\ EAC} = 1.030$$

**NSF198AJ08 Sub-Metrics:** Description: The SDD Baseline Execution Index (BEI) metric is an Integrated Master Schedule (IMS) based metric that calculates the efficiency with which actual work has been accomplished when measured against the baseline. The BEI provides insight into the realism of program cost, resource, and schedule estimates. For BEI, an index of <.95 is used as a warning indication of schedule execution underperformance. Goal is to achieve BEI value .95. Cumulative BEI equals actual tasks/activities completed divided by the baseline total tasks/activities.

The SDD Critical Path Length Index (CPLI) indicates whether or not the program schedule can be completed on time. This is an Integrated Master Schedule (IMS) based metric that utilizes the critical path methodology definition being: the longest, continuous sequence of tasks through the network schedule with the least amount of float, from contract start to contract completion. After contract start, the critical path is always measured from "time now" until contract completion. For CPLI, an index of <.95 is used as a warning indication that the program will not complete on time. Goal is to maintain CPLI value .95. Critical Path Length Index (CPLI) equals the Critical Path Length (CPL) plus or minus the Total Float (TF) divided by the Critical Path Length (CPL). The target efficiency ratio for both metrics is 1.00. An index greater than 1.00 is favorable, and an index less than 1.00 is unfavorable. .95 = Green .90 to <.95 = Yellow <.90 = Red

SDD Baseline Current vs. Actual Current Finishes/Month  
Program Cum BEI / CPLI Trend

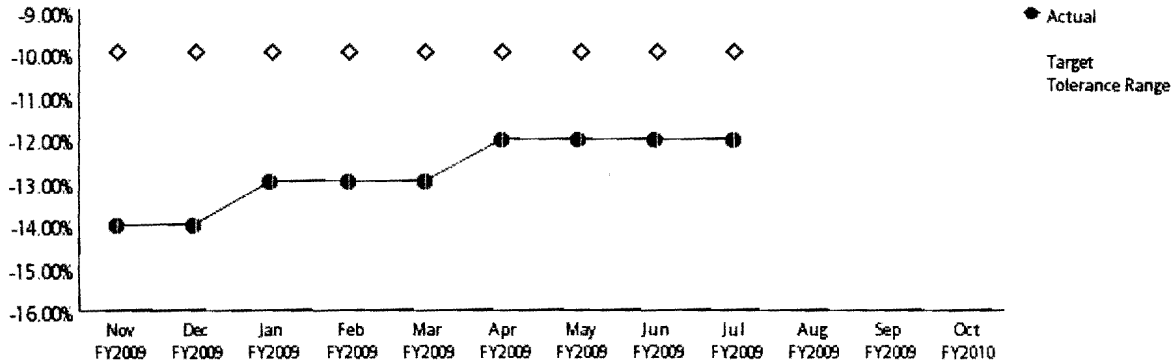


Cumulative SDD Program BEI and CPLI sub-metrics are rated Green. Cum BEI is at .98 and CPLI is at .99 for month end August 2009, however; monthly planned versus actual performance has averaged an approximate 40% completion rate over the last twelve months. MS 6.1 baseline replan dates were incorporated into the IMS month-end May 2008.



## Reduce Schedule Variation

**NSF198AJ05:** Description: Reduce the average Wing touch labor variance "at move to Mate" to within 10% by SDD completion. In addition to monthly performance indicators, linear trend lines are used to project out subsequent Wing builds that have not moved to mate yet – projection is used to access current and predict future Wing variance performance. Metric will be updated NLT the 20th of the following month. Green: <-10% variance, Yellow: -10% and -15% variance, Red: >-15% variance.



Metric Status: Yellow – Performance Indicator is rated Yellow this period with a current overall Wing average touch labor variance to schedule at -12%.

Trend: No Change

Chart 1 (below) is a breakout of the Wings which build up the -12% variation average metric. All SDD aircraft Wings have made it through the Wing build cycle. The Wing has reduced their out of station tasks travelled to Mate. The last SDD aircraft Wing (AF-4) moved to Mate at 92% complete even though it stayed in Wing build longer. This is very important since history has shown that Mate and Final Assembly performance has been significantly affected by the condition (maturity) and timing of the Wing delivery. This has contributed to the overall average schedule variance reduction.

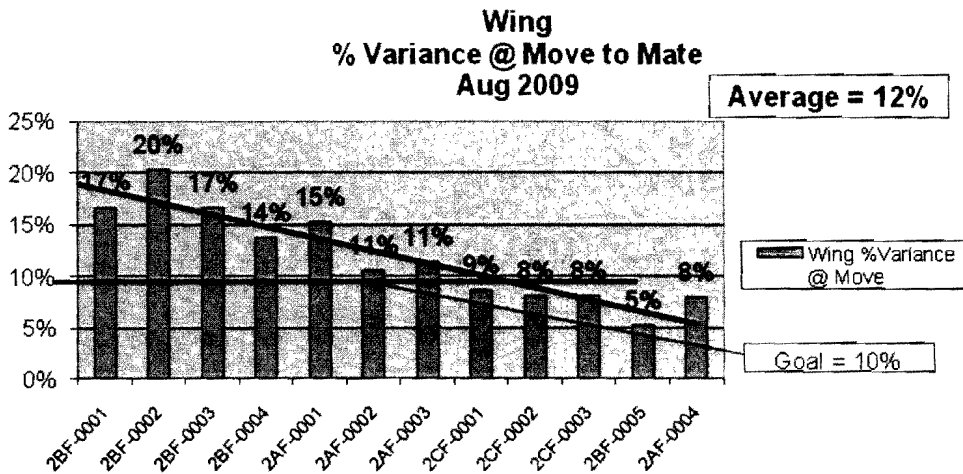


Chart 1

Chart 2 (sub-metric) below is a breakout of some of the aircraft that have either gone through or are in Mate and Final Assembly along with their associated % variance to schedule. Mate thru Delivery build performances continue to be under pressure to meet schedule requirements.

Mate's cost and schedule variances continue to be impacted by critical part shortages, high change traffic, difficult/inefficient work (out-of-station/out-of-sequence, part and tool locating via Metrology, integration of flight test instrumentation) BOM accuracy, late and/or constant rework of planning and tooling issues/availability. Some data adapted from program Format 5 CPR (July 2009) report.

Both our charts use SPI data for variance projections on Wings/aircraft that have not moved to Mate/Flight Line. Per Lockheed Martin, "The data used in the charts is from shop floor systems and is not auditable data or official EV data. It is for status purposes only."

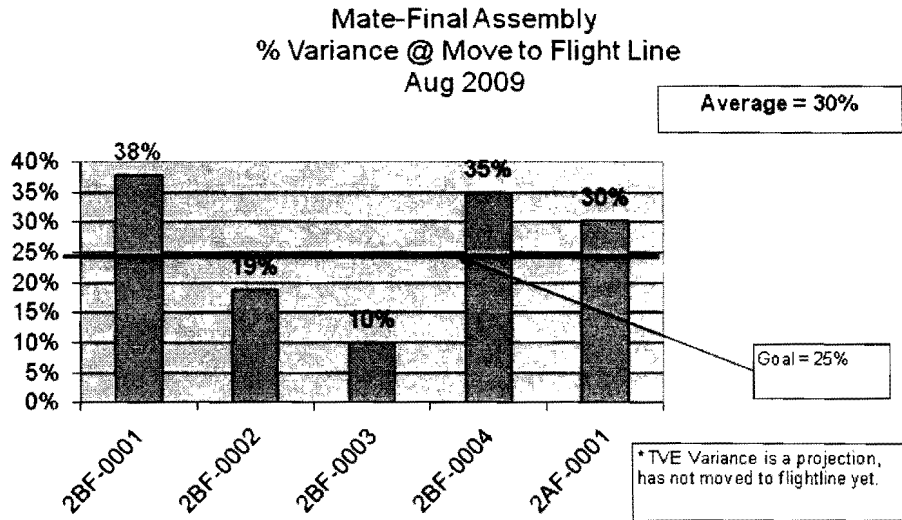


Chart 2

**Root Causes:** Schedule continues to be impacted by unplanned work caused by out of station tasks. The shortage of [redacted] tubes is driving schedule and inefficient build process. These shortages do not support the in-station work plan and will cause an increase of out-of-station work and cost. DCMA continues to be concerned with the amount of out-of-station tasks traveling to Mate and the flight line. In order to have a positive impact on overall throughput, LM Aero must find a way to simultaneously continue to reduce out-of-station tasks and improve their ability to start and finish on plan.

**Contractor Actions:** The WAM (Wing at Mate) Team is working with the Mate team to mitigate the planned out of station work schedule impact to Mate through communication of the impacts to the daily assigned tasks and being able to capture these in crew boards for Wing sequence issues. Also LM Aero's plans to recover schedule include improving on-time component starts, decrease out-of-station inefficiencies by driving increased completion at move and the elimination of the wing/mate overlap tasks.

**DCMA Actions:** Regular interface with LM project teams to: assess progress on recovery initiatives look for process review or corrective action opportunities, monitor impacts on Mate, update metrics and report progress in monthly report to customers.

**Estimate when PC will achieve goal:** Goal may not be reached until after SDD completion (2014) when Wing and Mate overlap is eliminated.

The following table depicts the SCOP completions per test article/aircraft. The table includes the total SCOPs planned per aircraft, the number of SCOPs completed as of this reporting period (2 Sept 09), the percentage of SCOPs completed relating to the total planned for the specific test article and the percentage of testing completed prior to test article rollout from the factory to the Fuel Barn. No aircraft have moved from the factory during this reporting period.

### SCOP Completions per Test Article / Aircraft (A/C)

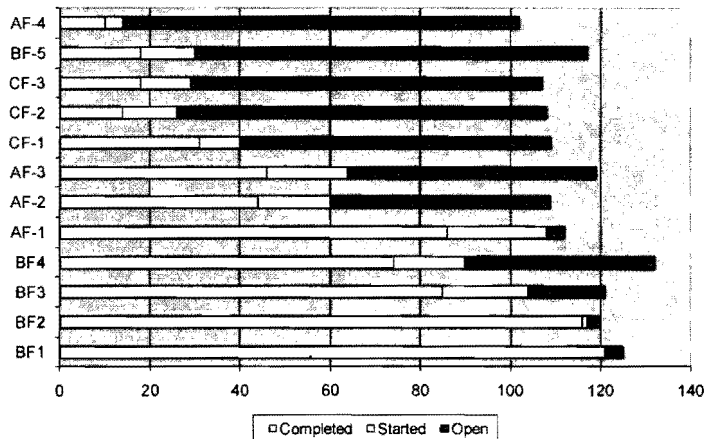
Test Article	Total SCOPs Planned	SCOP Completed	%Complete (Total A/C)	% Complete prior to Rollout
BF-1	125	121	96.80%	28.0% (18 Dec 07)
BF-2	120	116	96.67%	51.6% (16 Aug 08)
BF-3	121	85	70.25%	61.98%(2 July 09)
BF-4	132	74	56.06%	30.8% (21 Jan 09)
AF-1	112	86	76.79%	38.1% (5 Feb 09)
AF-2	109	44	40.37%	
AF-3	119	46	38.66%	
CF-1	109 <sup>(1)</sup>	31	28.44%	
CF-2	108 <sup>(1)</sup>	14	12.96%	
CF-3	107	18	16.82%	
BF-5	117	18	15.38%	
AF-4	102 <sup>(1)</sup>	10	9.80%	10/6/09

<sup>1</sup> Newly released SCOPs added to effectivity during this reporting period

<sup>2</sup> SCOPs removed from the effectivity during this reporting period

This chart depicts the current SCOP completion status for all flight test articles in SDD. List is organized by current firing order as depicted in Master Schedule 6.1.

SDD SCOP Completions - Aircraft



The following table is provided to track Wing specific SCOP testing prior to move to Mate and percentage of testing completed prior to test article moving from the Factory Floor to the Fuel Barn.

### SCOP Completions on Wing Assemblies

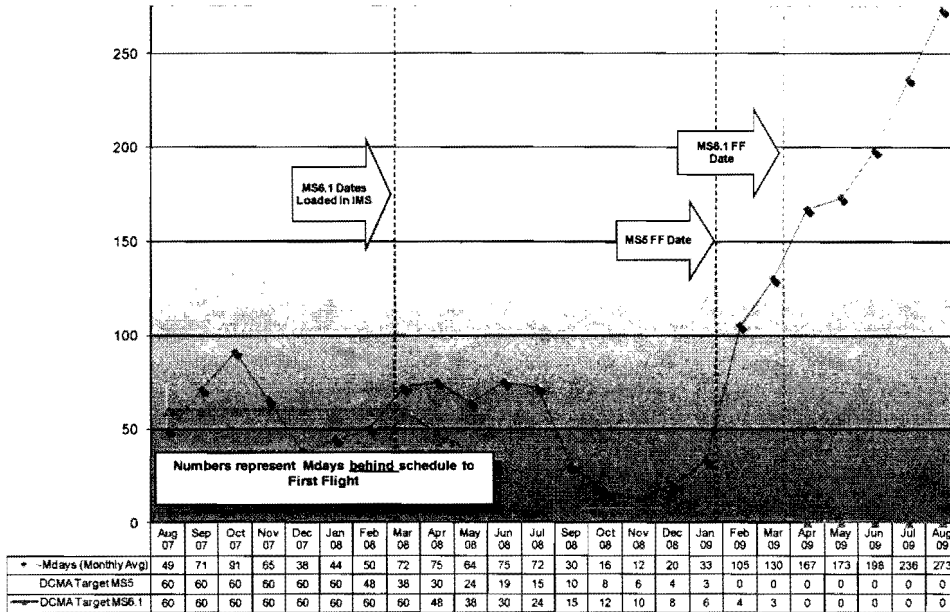
Test Article	Total SCOPs Planned to Date	%Complete (No. SCOPs Completed)	% Complete Prior to Rollout	Avg Days Behind MS 6.1 (for Completed Tests)
BF-1	15	100% (15)	40% (6)	-170
BF-2	18	100%(18)	83.3% (15)	-216
BF-3	18	94.4%(17)	83.3%(15)	-300
BF-4	19	73.7%(14)	42.1% (8)	-235
AF-1	14	100.0%(14)	68.8% (11)	-217
AF-2	14	85.7%(12)	-	-201
AF-3	16	81.3%(13)	-	-170
CF-1	18	61.1%(11)	-	-176
CF-2	17	23.5%(4)	-	-102*
CF-3	18	33.3%(5)	-	-139*
BF-5	18	22.2%(4)	-	-137*
AF-4	17	5.9%(1)	-	-42*

<sup>1</sup> New wing specific SCOPs added this reporting period

\* Wing testing is still in-work. Travel work from [redacted] will be in effect until LRIP 2? Value is not final until all testing is completed.

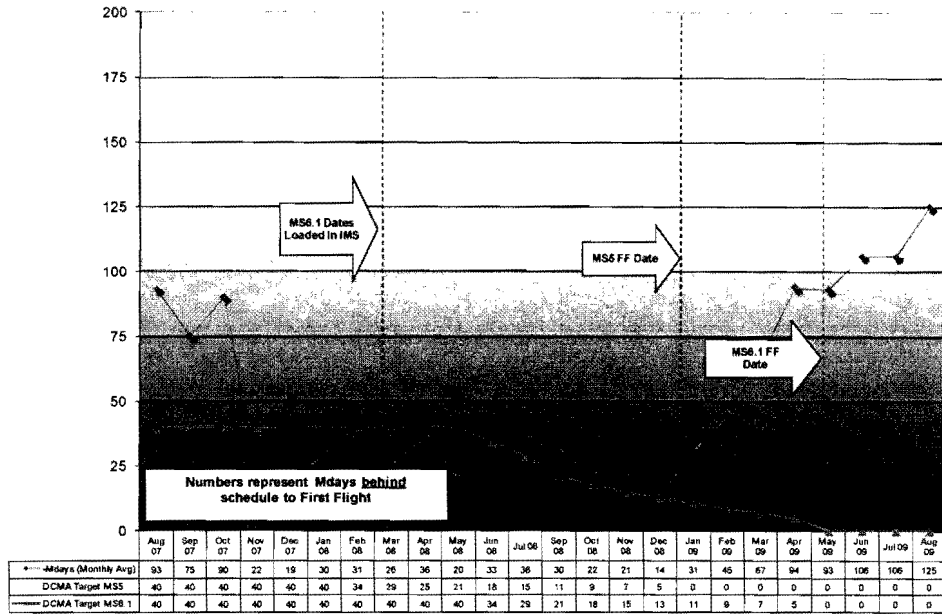
**NSF198AJ05 Sub-Metric:** Description: Reduce monthly average of negative float manufacturing days (Mdays) of key variant First Flight dates over baseline aircraft's (AA-1) delayed (~80Mdays) First Flight date. BF-4 (STOVL - Mission Systems Article) targets a 50% reduction in negative float over baseline, incorporating a 20% reduction each month in negative float Mdays, AF-1 (CTOL - Optimized vs. AA-1) targets a 50% reduction in negative float over baseline, incorporating a 15% reduction each month in negative float Mdays, 12 months out from Master Schedule First Flight date. **(Note: Mdays are displayed as positive values, but represent behind schedule status).**

**BF-4 First Flight (24 March 09 - MS6.1) Total Slack Trend**  
MS6.1 dates in MS 9 Mar 08



BF-4 sub-metric is rated Red, with an August average of 273 Mdays late calculated to MS 6.1 first flight date of 24 Mar 09. BF-4 baseline rollout was 21 Oct 08 – rollout occurred on 21 Jan 09. Projected first flight is March 2010 as of 13 Sep 09 – additional build period to complete the aircraft continues.

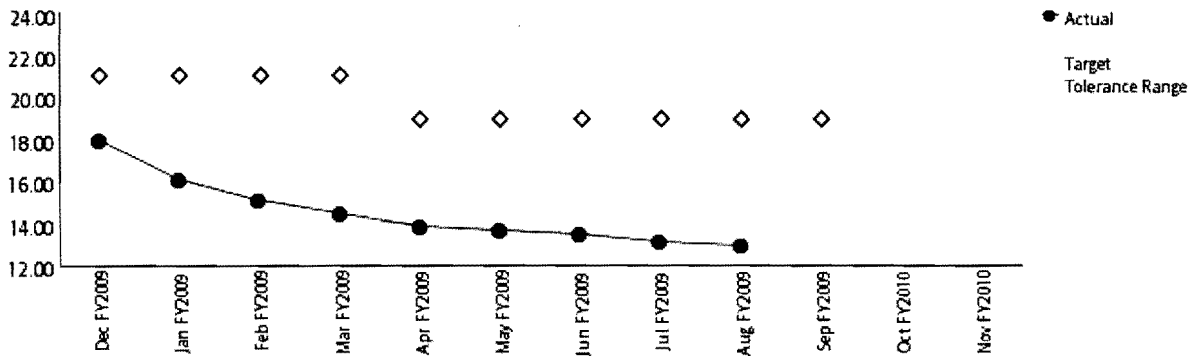
AF-1 First Flight (14 May 09 - MS6.1) Total Slack Trend  
MS6.1 dates in IMS 9 Mar 08

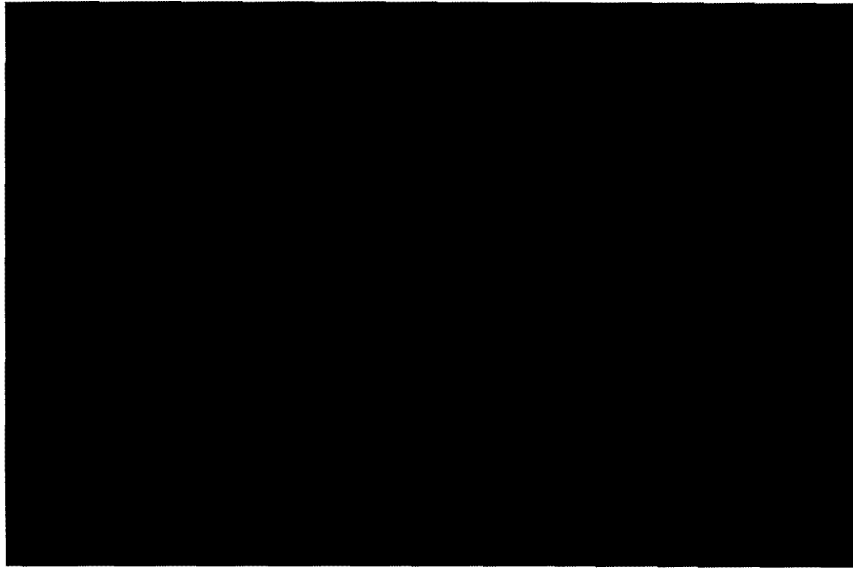


AF-1 sub-metric is rated Red, with an August average of 125 Mdays late to first flight date of 14 May 09. Baseline rollout date was 25 Nov 08 – aircraft rolled on 5 Feb 09. Projected first flight is late October as of 13 Sep 09.

### Non-Conformance Reduction

**NSF198AJ06:** Description: 10% reduction in MRB discrepancies per year. Metric shows the average number of MR defects per 1000 actual manufacturing hours. The goal is to reduce MR defects per 1000 actual manufacturing hours by 10% per year. Metric is based on contractor provided data that is collected updated in metrics manager NLT the 20th of each month and averaged against all prior months to illustrate normalized trend. Green: <goal of 21, Yellow: within 10% of the goal, Red: >10% above the goal of 21.





Metric Status: Green

Trend:

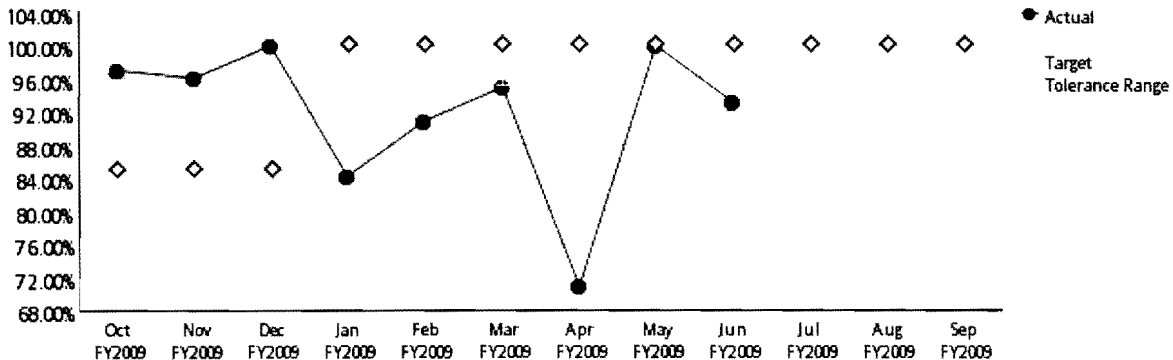
Summary of Metric Status: Metric illustrates improving trend – maintained for the last 12 months.

Contractor Actions: LM Aero has reduced their goal for MR actions for 2009, meeting the goal so far this year.

DCMA Actions: Reducing the goal to reflect an effort to further reduce the amount of MRB actions for this year. DCMA is evaluating the new contractor goal to see if a more than 10% reduction in MRB actions is warranted.

### Safety of Flight (SoF)

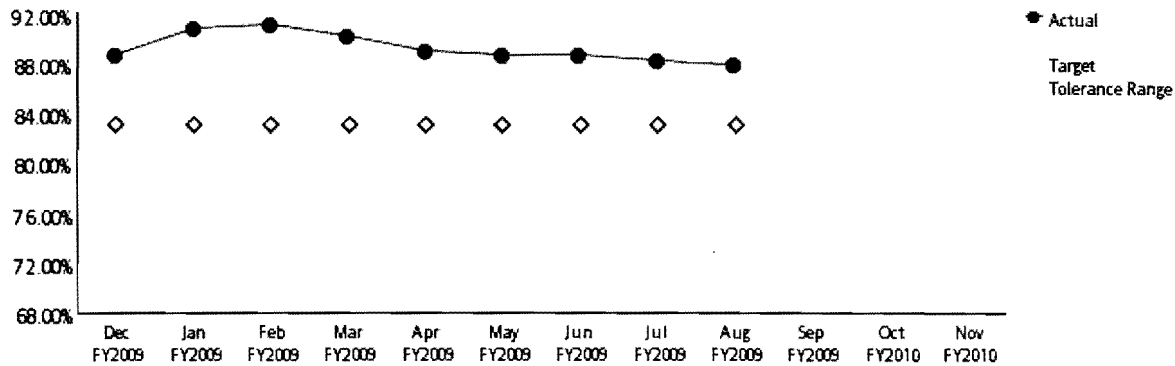
**NSF198AJ01:** Description: Measures contractor capability to present a successful Safety of Flight inspection on first attempt. It is a measure of quality where the target is 100%. Normally, SOF metrics measure the number of SOF escapes to the customer. We are measuring the contractor's ability to present DCMA SOF inspections capable of passing an inspection or test the first attempt. This allows us to prepare the contractor for SOF expectations once production begins. We will adopt a traditional SOF metric based on customer reported escapes once delivery of aircraft begins. This metric has been re-adjusted as of January 2009 to reflect a more accurate account of what is being presented to DCMA. The contractor's processes are not mature enough (currently SDD) to present to DCMA for passable SOF inspections on the first attempt. Data is updated in Metrics Manager NLT the 20th of the following month. Performance data obtained from local DCMA quality data base as a result of DCMA inspections. Green: 100%, Yellow: 95%-99.9%, Red: <94.9%.



Metric Status: Red

Trend: Degrading

### Improve Software Productivity



Trend: No Change

Summary of Metric Status: Current performance is exceeding our target of 83%.

Root Causes: DCMA LMFV performed a risk assessment for this revised metric. Process areas of focus include Software Product Evaluation (SPE) and Interface Work Package (IWP) processes. Another focus area is improved communication through consistent use of developmental software configuration management practices.

Contractor Actions: The contractor's process includes process improvement activities (Kaizens, Tiger Team Efforts, Value Stream Mapping, Lean Events, etc).

DCMA Actions: DCMA is still attempting to witness a sampling of SDL's and ADL's however, access to the loads has been difficult to gain because the particular ADLs chosen to witness have been preempted by unfinished work. DCMA had an initial meeting with the contractor to discuss the Joint Process Review (JPR) tentatively scheduled for October. The contractor presented ideas that DCMA will consider as potential process review candidates. DCMA recently conducted a brief review of the JSF Technical Performance Measurement Plan. We also reviewed Mission Systems TPM status and noticed the scorecard has TPMs rated Red for several months with the last update based on a grassroots effort back in August 2008. There is a [redacted] watch item "Possible SW redesigns due to throughput/sizing issues". DCMA has not found an explicit requirement stating frequency of TPM updates, however; DCMA has a growing concern regarding adequate contractor insight into throughput, memory and I/O.

DCMA [redacted] Prognostics and Health Management (PHM) Requirements [redacted] [redacted] - Block 2.0 design activity which was anticipated to be complete on or near 31 Oct 09 is now estimated to complete in May 2010. DCMA continues to monitor progress.

DCMA [REDACTED] Prognostics and Health Management (PHM) Software [REDACTED]  
 [REDACTED] DCMA recently witnessed a PHM System Object Test for the EW system object (25 Aug 09). The test was on a moderately complex system object, and ended successfully. DCMA intends to be present at as many of these types of tests as possible.

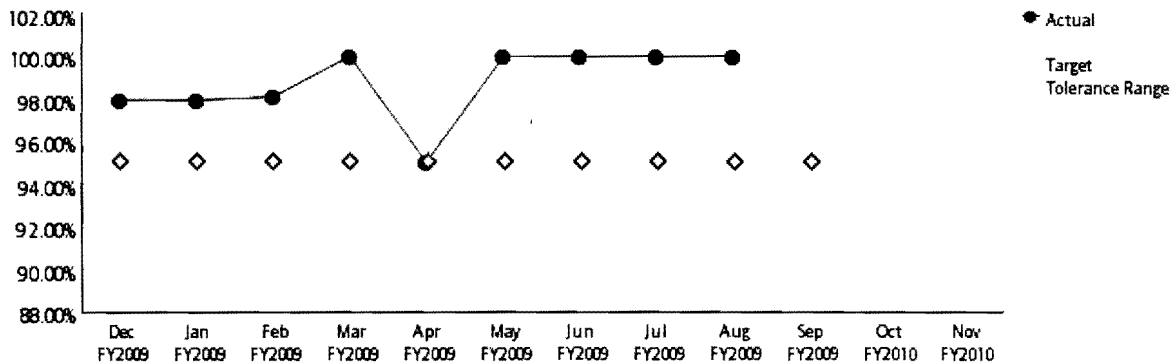
DCMA [REDACTED] – External Communications Domain] – MADL IB Block 1.0 Design and Unit Test are both complete, and Block 2.0 design has begun. There are no other significant updates to report.

DCMA [REDACTED] Mission Domain] – Block 1.0 design for FTU-B and C design is 100% complete. Code/Unit Test for FTU-B Code is also 100% complete. Desktop Testing is in progress for all system objects.

DCMA [REDACTED] – Fire Control NAV & Stores] (Responsibility for NAV functionality relocated to WBS 1428 from Own Ship Sensor [REDACTED] – Block 2.0 Software development has begun – new pressures have been identified and are being monitored.

### Improve Minor Variance

**NSF198AJ19:** Description: Maintain at least a 95% correct classification rate of variances. Cumulative number of minor variances classified correctly divided by the cumulative number of minor variances reviewed. Metric should be updated at the end of each month but no later than the twentieth of the following month. Green: % of properly classified minor variances is ≥95%, Yellow: 90% up to but not including 95%, Red: <90%.



Metric Status: Green

Trend: No Change

Summary of Metric Status: The contractor had a correct classification rate of 100% this month.

Root Causes: No root causes identified at this time.

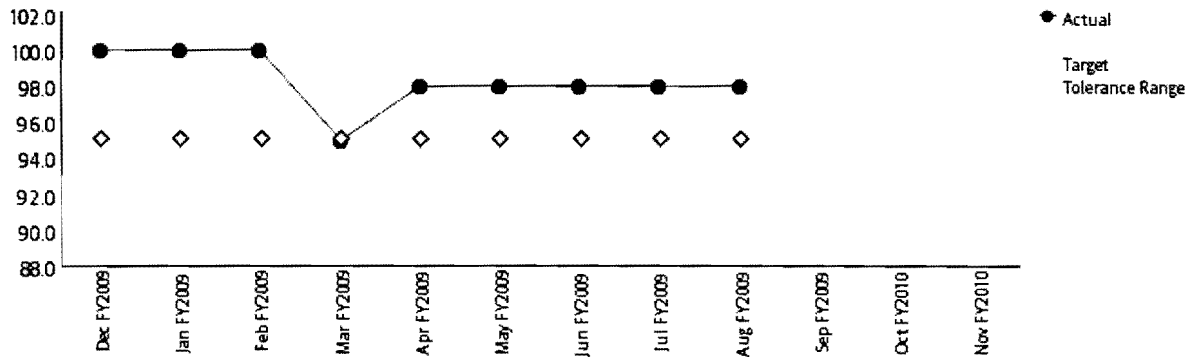
Contractor Actions: No contractor actions required at this time.

DCMA Actions: None at this time other than to continue to review Minor Variances for correct classifications. Ensure the contractor takes the necessary corrective actions to preclude any incorrect classifications in the future.



## Improve FCA/PCA

**NSF198AJ20:** Description: Ensure that at least 95% of systems reviewed in interim FCA/PCAs meet the design requirements. Technical Description: Verification of the F-35's physical configuration to the design requirements by performing PCAs (physical configuration audits). Percentage of part and assembly numbers reviewed in interim audits in accordance with engineering drawings divided by total population of parts and assemblies assessed. The data used to assess this comes from interim audits from suppliers. Green: % of parts meeting design requirements is  $\geq 95\%$ , Yellow: 90-94%, Red:  $< 90\%$ .



Metric Status: Green

Trend: No Change

Contractor Actions: Meetings with DCMA personnel.

DCMA Actions: Review of contractor processes and reports.

LMFW conducted a pre-planning meeting to discuss upcoming FCA/PCA on the Nose Landing Gear Wheel Assembly at [REDACTED]. This audit subsequently was pushed back 8 weeks due to a discrepancy within their Technical Assistance Agreement (TAA) with the supplier.

AC Contactor scheduled for 11-13 August 09. The audit will be held at [REDACTED]. The Alternating Current Contactor Module (ACCM) includes the equipment necessary to switch the six alternating current (AC) phases from the Power and Thermal Management System (PTMS) generator to the PTMS controller (PTMSSC). It was determined that the current PBS was the latest revision in DOORS and all requirements from hardcopy to DOORS matched with exception that the paragraph numbering scheme for ACCM2-442, 447,450, 452, appear out of sync with the PBS. The Verification Cross Reference Matrix (VRCM) was used to walk through all Shall requirements (144).

A sampling of the AS9102 First Article Inspection for the subject product was performed at the supplier [REDACTED]. Reviewing the data for the contactor, it was noted that [REDACTED]

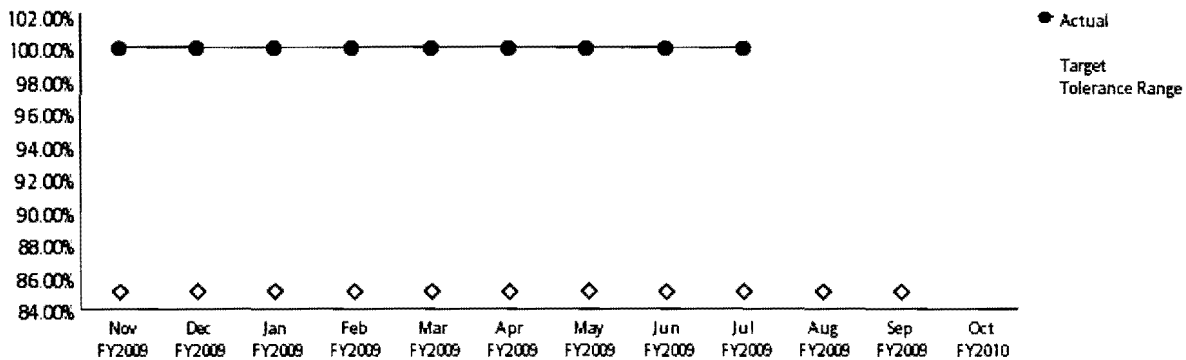
[REDACTED] A Request for Action was generated for [REDACTED] to review the CMM operating procedure and/or training procedure for data integrity and to report back. There is a systemic issue with the CMM process controls that needs to be addressed by [REDACTED]

It was noted on one drawing [REDACTED] that the cable length was listed as "Dimensions are for engineering use" and so no cable length measurement was made. LM feels that cable length should be measured as it affects ability to install the unit. On sheet 2 of the same drawing there is a cable length dimension of [REDACTED] ref. this dimension was recorded in the FAI as [REDACTED]. The tolerance on 2 place dimensions is [REDACTED]. So this dimension is considerably under the tolerance.

The outcome of the audit resulted in a total of [REDACTED]. The critical actions have to do with additional information to satisfy verification requirements or approval of changes to the PBS via CR-016708.

### Maintain Assist Audit Request Timing

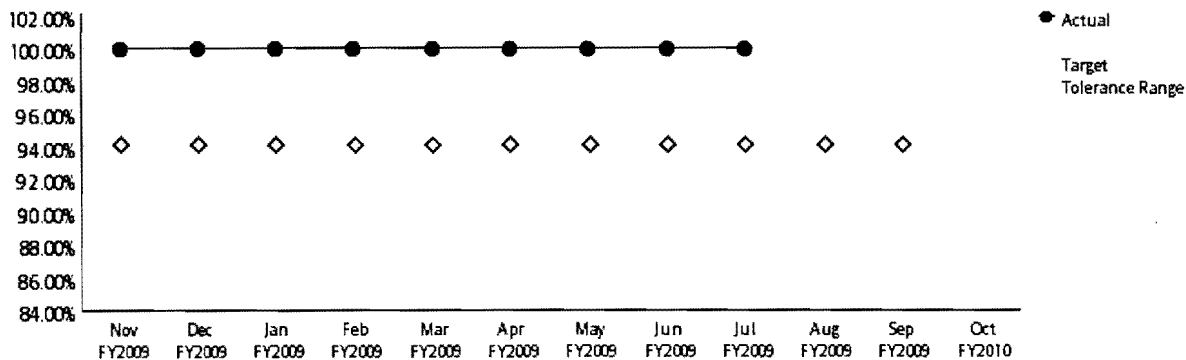
**NSF198AJ13:** Description: Process contractor/PCO requests for domestic/international Assist Audits within 2 business days 85% of the time. The percentage will be calculated by dividing the number of Assist Audits processed within 2 business days by the total number of Assist Audits requested. Source data will be obtained prior to the 15th of the following month and updated in Metrics Manager NLT the 20th of the following month. Green: >84%, Yellow: 75-84%, Red: <75%.



Metric Status: Green

### Maintain FAR Requests for Contract Closeout

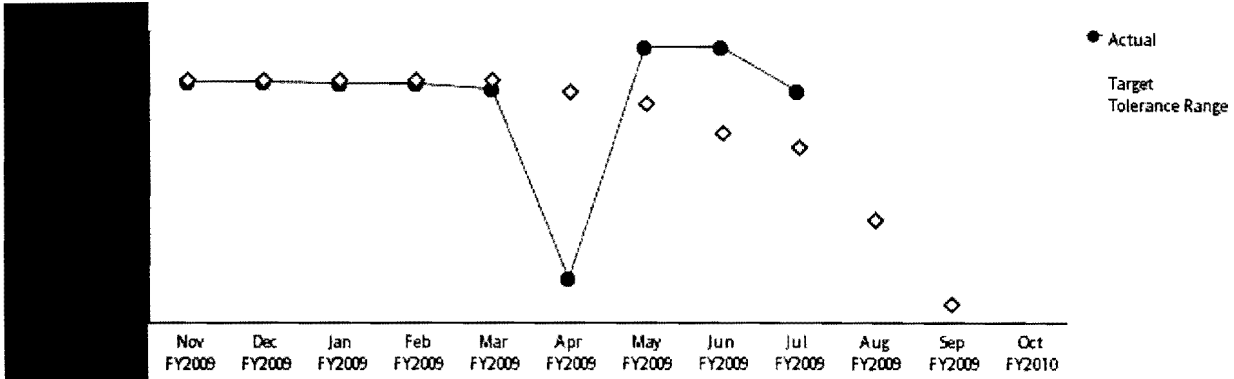
**GDDAGYOC02:** Description: Maintain 94% contract closeout actions within the Federal Acquisition Regulation (FAR) mandated timeframes. The percentage will be calculated by dividing the number of on time contracts closed by the total number of contracts closed. Source data will be obtained prior to the 15th of the following month, and updated in Metrics Manager NLT 20th of the following month. Green: >93%, Yellow: 85-93%, Red: <85%.



Metric Status: Green

## Reduce Cancelling Funds

**CDDAGYOC01:** Description: 90% of canceling funds will be billed and/or de-obligated before the end of the fiscal year. Attainment of the goal will be calculated by dividing the total dollar amount of canceling funds billed and/or de-obligated by the total amount of canceling funds identified. Source data will be obtained prior to the 15th of the following month, and updated in Metrics Manager NLT the 20th of the following month. Green: >89%, Yellow: 80-89%, Red: <80% of the funds identified to cancel at year end.



Metric Status: Red

Trend: Slight improvement

Root Causes: [Redacted]

[Redacted]

### Appendix A – EV Assessment Criteria

Rating Criteria is based on the DCMA VAC% and when possible should include MR in the DCMA IEAC

Green - VAC% > -5%

Yellow - -10% < VAC% < -5%

[Redacted] - VAC% < -10%

N/R - Not Rated or Not Reported